MASS GIS   Data Viewer   <u>*Student Training*</u>

Focus: Conservation/Recreation…Trails

<u>*Local Perspective*</u>   <u>*Lesson #6*</u>

<u>*Introduction*</u>

> Social Studies
> Mathematics
> Language Arts
> Science

"Urban Trails – Designing a Historical and Open Space Walking Trail in your Community"

<u>Background:</u> In urban areas it is difficult to have any "long distance trails" as previously observed in lessons #4 and #5. But urban environments are still in need of areas where people can walk, sights can be seen, and points of interest can be visited. The Freedom Trail in Boston is an example of an urban trail that attracts thousands of visitors annually, providing recreation and a diversity of learning opportunities for Boston's visitors. The requirements for designing these urban trails vary, and focus mostly on the goals of the group charged with creating a new urban trail. Often times, "urban trails" not only include historical sites/areas, but also land classified as open space. These open space areas often are open to the public and provide excellent locations for respite, relaxing, or times to just enjoy more natural environments. In this lesson, we are assuming that "urban areas" are communities with more than 25,000 people. To complete this lesson, you should first check to be sure that you have enough historical sites/areas in your town. If not, do Lesson #7 on Open Space trails in rural areas.

<u>Problem:</u> Several groups within your community including the historical commission, conservation commission, and the school committee, would like students to create an "urban walking trail" that could be enjoyed by local residents. The major purpose of the trail would be to provide students and citizens with opportunities to learn more about the historical resources in their community, specific neighborhoods, and to provide access to areas of land classified as "open space".   A special committee has been formed in your community known as the "Urban Trails Committee". In their monthly meeting they voted to contact students in area school systems, to create draft maps and generate ideas on areas that might be suitable for the development of an Urban Trail. In designing your trail, remember the committee prefers that walkers are able to return to the beginning point. In designing your trail the draft view of a proposed trail must include the following criteria:

●Length of trail between 3-5 miles long

●Pass by at least 3 structures or areas of historical interest
● Pass by at least 2 areas designated as open space that have public access
● Return to the starting point
● Trail needs to be accessible to the handicap, or a plan presented that would enable the handicapped to use the trail.

Your Task:

Use the MassGIS Data Viewer to gather your information concerning possible historical sites/areas, and open space areas in your community.   Also examine the existing streets and determine which ones are suitable for walking safely. From your information and Viewer observations, you are to answer basic questions from the Urban Trails Committee, complete a Data Sheet based on your Viewer observations, print a draft view of the your proposed trail's location, and provide a statement presenting the facts as to why your trail meets the criteria established by the Urban Trails Committee.

DEM Questions:

1. List the names of the historical sites/areas in your community.
2. In what part of your community would you like to have the trail.
3. What is the total length of your trail?
4. Does your trail end by returning to the starting point?
5. Are there any parking areas, public transportation or other types of infrastructure that encourage student and citizen access to your proposed trail?
6. Do you think your trail is accessible year round or just seasonally?
7. Can your proposed trail be accessed by the handicapped?

Mass Data Viewer Skills:
- *Setting an Extent*
- *Adding Themes to a View*
- *Turning Off Unnecessary Themes*
- *Using Zoom to Selected*
- *Changing the View's Scale*
- *Labeling Using Theme Properties*
- *Adding Image Themes*
- *Saving Views as Export Files*

Viewer Buttons and Tools:
- *Open Theme Table Button*
- *Query Tool*
- *Pan Tool*
- *Label Tool*
- *Draw Tool*
- *Identification Tool*

MASS GIS Data Viewer   _Student Training_

Focus: **Conservation/Recreation…Trails**

Local Perspective   _Lesson #6_

Data Viewer Skills

> **Social Studies**
> **Mathematics**
> **Language Arts**
> **Science**

"Urban Trails –
Designing a Historical and Open Space
Walking Trail in your Community"

Creating an Urban Trail View

1. Setting an Extent (Finding your Community's Location)

   a. Go to the "Z" button and select the extent "MA Towns"
   b. Scroll through the list of communities, and select your community .
   c. Click OK
   d. Be sure that the MA Towns theme is turned on (checked).

2. Adding Themes to the View

   a. To design an "urban trail" as described in the problem, you need to add several themes. Begin by going to the "A" button, and select the menu "Cultural Resources", Click OK. In the next menu section, select "State Registry of Historical Places", click OK.

   b. Return to the primary Theme menu, and select "Infrastructure", then "Census TIGER Rds", then "Tiger Street Segments (arcs)". Click OK. (This will take several minutes to load. Once added to the View's Table of Contents, uncheck the roads.

   Hint: As we zoom in later, our other themes will load faster if we are not waiting for the TIGER roads to load. When we need them we will turn them on.

   c. In the Theme menus window, select "Conservation/Recreation" menu, then "Openspace" menu, then "All openspace-Transparent". Click OK

3. **Turning Unnecessary Themes Off Temporarily**

a. When the "State Registry of Historical Places" appears, you will notice that five data layers are placed in the Viewer's Table of Contents. Some of these layers are needed for our community, and others are not. Begin by making sure the "points" data layer for historical places is checked.

b. Some of the "polygon" data will not be needed by your community. You have several possible ways of seeing which layers are needed and which are not. One method would be to: Turn each one of the polygon data layers off individually. If no polygons seem to be affected by the turning off of the layer, leave it turned off. If polygons are removed when you turned off the layer, turn it back on.

c. A second method: Open the first (polygon) historical theme table. Go to the 'Edit" menu and select "Select all". Close the table. Look at your view. All historical areas controlled by the first historical polygon theme will appear yellow in your view. Now open the second historical theme table, and select all of its sites. If no more are selected, than you can uncheck the second theme layer. If some show yellow, keep it turned on.

d. Repeat the process for the other historical (polygon) theme layers. *(1) Record in your data sheet which polygon data layers apply to your community.*

e. When finished, make all the Theme tables that are checked for the historical polygon data, active by holding down the shift key and clicking on the text for the themes in the table of contents/legend area. Then go to the Theme menu and select "Clear all selected Features" for each theme or click on the 3-punched blank page button.

4. **Using the Query Tool to find your School.**

a. Make the "Openspace by Ownership" theme active.
b. Go to the Theme menu and select "Table" or click on the piece of graph paper button.
c. Select the "Query" button from the "Button Menu".
d. Do a query to find your school. In the "fields" box, select "Site_name".
Hint: Remember to double click your mouse when selecting the "Site_name".
Then click once on the equal sign, and scroll through the "Values" box until you see your school.
Hint: If you do not see your school, select any school in your community.
e. Click "New Set". Close the "Attributes of Openspace by Ownership" window.

5. **Using the View Menu to Zoom into Selected**

a. When you did the query in the Ownership you actually selected your school's polygon shape in the theme. You should have seen your school polygon become yellow in your View. (It is possible you cannot see your school because its polygon is so small in the scale you are working.) (*2) On your Data Sheet record*

the current scale at which you are working. Get this from the scale box at the upper right corner of your screen.

b. Open the View menu, and select "Zoom to selected". The view will change showing your selected school at a larger scale. The school area polygon that was yellow will not longer appear yellow in your View. Use the "ID" tool to see if the parcel is really your school. ***(3) Record the scale that your Zoomed In View changed to in your Data Sheet.***

6. Changing the View's Scale to Facilitate Study

a. Go to the scale bar in the upper right corner of your View. Change the numbers so that they read 1:10,000. Remember this means that 1 unit on the View equals 10,000 units on the ground. Remember that 5,280 feet are in one mile. ***(4) How much of a mile does this new scale represent on the ground?***

b. Use the "Pan Tool" to center the school in your View once the scale has changed.

7. Labeling using the Theme Properties

a. In previous lessons, we learned that it is possible to activate a theme, and by using the"auto label" under the Theme menu, label all features of a particular field associated with the theme. In the "Runtime Version of the Data Viewer", the field that will be used for auto labeling has already been selected. Sometimes this field is not what we want. In this case, we will need to choose the field we want to use as the name on the labels.

b. Make the Open Space theme active. Go to the "Theme" menu and select "Properties". A Theme Properties window appears on your screen. – In its Table of Contents, select "Text Labels".

c. In the "Label Field", select "Site_name".

d. For the "position of text relative to label point", choose the "Text circle in the Center".

e. Be sure that the "Scale Labels" is checked.

f. Click OK

g. Go to the Window menu, select the "Show Symbol Window". In the Symbol Window, select the text icon palette.

h. Make the font size 9, the style bold, and click "create marker". Close the "Symbol Window".

    i.   Click on the "Label Tool" and select the "Call Out" label. Near the school draw out a small line and release the mouse. The name of your school should appear. Be sure to locate it in an area where historical features and other open space sites are not covered by the name label.

Hint: You may have to select the school label using the pointer cursor, delete it and start this process again.

8.   Using the Identification Tool to document your Sites

    a.   We will use the Identification Tool to identify the various open space sites located near the school. Begin by making sure that the "Open Space" theme is active.

    b.   Go to the Tool bar, and select the "Identification Tool". The pointer cursor now becomes an "I" tool. Place the "I" tool over an open space polygon in your View, Click once. To find its name, scroll through its record. *(5) Record the "site_name" in your Data Sheet*.

    c.   Continue this process until all of the open space areas have been identified and recorded on your Data Sheet.

    d.   Make the "State Registry of Historic Places" "point" theme active. Use the Identification Tool to identify the various points in your View. *Again (6) record the "historical name" on your Data Sheet.*

    e.   Make the "State Registry of Historic Places" "polygon" theme active that contains shapes shown in your View. Use the Identification Tool to identify the various polygons in your View. *(7) Record the "historical name" for each polygon in your view on your Data Sheet.*

9. **Using Image Themes for Local Identification and Association**

    a.   Go to the "A" button and select the "Images" menu. Under this menu, select "MassGIS BW orthos 1:5000. In the next menu, select the "Sid" version. Click OK. (Select the .5m sid image)

    b.   It will take a few minutes for the image to fully load. We changed the View scale, because if the scale is too large an area (such as 1:100,000), it will take a long time for the images to load.

    c.   The "image" theme will automatically be placed at the bottom of your Table of Contents, so all the other data layers are on top of it. *(8) Do you see any other points of interest in the Ortho Photo you recognize and that you would like to include in your Trail Design? If so what?*

10. Designing our Trail using a Draw Tool

    a.   Refer back to your Data Sheet, and examine the various open space parcels you have in your View, and also the historical sites. Decide which parcels and sites

you would like to include in your trail. You should have discovered that at the scale of 1:10,000, a one inch line will equal about a .16 mile line on the ground.

b. To get the 3-5 mile trail, you can have a very long line on your map at this View scale.

c. Go to the View menu and select "Properties". Make the "Distance Units" miles. Click OK.   *(9) Why are we making the "Distance Units" miles and not changing the "Map Units"?*

d. Go to the Window menu and select "Show symbol Window". Open the "Pen Palette" and make the size 2.

e. Open the "Color Palette" and make the "Foreground" Red or Bright Yellow. Close the Palette Windows.

f. You may find it easier to work without any of the Image themes. If so uncheck these themes, and check on the TIGER rds. Theme. It might be easier to follow your streets and to also see where they are in relation to the historical sites (points, polygons), and the open space areas.

g. Go to the "Draw Tool", select the "Zig Zag Line". We are using the zig zag line because this enables us to turn corners, and operates just like our measure tool. Click once to start the line, once again to turn the line, and double click to end.

h. Once you have decided where you want to travel for your trail, use the "Zig Zag" draw tool to mark your path. Remember you must return to your point of beginning. By watching the lower left corner of your screen, you will notice that the "Zig Zag" tool also calculates the measurement of your line. The line you draw will not show a color until you double click the mouse when you finish the line

Hint: Oops, hope you remembered to set your distance units in the View "properties". If not you may be reading meters instead of miles.

i. Your "Zig Zag" path should be turning red or yellow when you double clicked at the end. *(10)When finished, record your total mileage on your Data Sheet.*

11. Using the USGS Topgraphic Images
a. Some people find working with the USGS Topographic Images easier to read. Uncheck the Ortho Photo image first. Go to the "A" button and select the "Images" menu. Then select "USGS Topographic Maps", and select "Sid". Click OK.

> **b.** You should now see all of your turned on themes above the USGS topographic Map image of the area. Your red or yellow trail line should be superimposed over the USGS topographic map. If you are not happy with the line, select it with the cursor and delete it. You may redraw the line using the USGS topographic map as the "base" map. ***(11) Planners often use the term "base map". If the USGS topographic map is the base map in your View, tell what you think a "base" map is on your Data Sheet.***

12. Saving your Draft Trail Map As an Export File

> a. Decide if you prefer an Ortho Photo as the base map, or the USGS Topographic Map as the base map. Whichever image you prefer, make it the checked image in your View. Be sure to uncheck the other image.
>
> b. In this case, we will now print a "layout", but will "export" the view into a file and save it as a jpg. We will not actually print it. We will not be able to edit it, but we will be able to save the original draft trail design.
>
> c. First we need to make a label for the Trail View. Go to the "Graphics" menu and select "Text and Labels Default". Uncheck the box for "symbol window".
>
> d. In the "icon" images, select the text rectangular box in the first row. Make the font size 16, and the style bold.
>
> e. Be sure that the outline box is checked. Make the outline black and the fill white. Uncheck "Use drop-shadow".
>
> f. Click OK.
>
> g. Go to the Text Label button, and select the "rectangular label". Move the cursor over your View in a space where you would like the Title Box to appear. Click once. A window box will appear. Type in the following:
>
> > (Your Community's Name) Urban Trail
> > Draft by (your initials)
>
> Be sure to select the "centered" block in the Text Label window (Horizontal Alignment). Click OK. The title should now appear on your View. Use the pointer cursor to select and move the box in the View (if necessary).
>
> h. Now go to the "File" menu and select page set-up. Be sure to pick Landscape. Be sure the correct printer is listed in the "name" box. Click OK.
>
> i. Return to the File menu and select "export". In the window, make sure the folder is the "C" drive, and the "temp" folder. In the "List Files of Type", pick JPEG. In the Export window, type "your community's name and then the word trail with dot jpg. Example: (Bostontrail.jpg).

    j.   Click OK. (Your teacher or instructor may have you save the "Export" version to a different folder than what is listed above.)

13. Using the TIGER Information to Identify Streets in your Urban Trail

    a.   Return to your View. Uncheck the "Topographic Image" in your View's Table of Contents if it is checked. Check on the Orthophoto Image.

    b.   Check on the "TIGER rds" theme.

    c.   Back in step 7 we learned how to change the label properties. You must do this again for the TIGER rds theme. Follow the same steps as ex.7, but choose "streets" as your label field.

    d.   Make the TIGER rds theme active. Use the "ID" tool to identify the streets used in your trail design. Hint: If you cannot see the streets, you have two options: (1) change the street color so you can see it over the ortho photo image, or (2) uncheck the ortho photo image and do not use it. *(12) In your Data Sheet, make a list of the streets or roads used in your Trail design.   (13) Write a brief description that provides directions so an individual could walk your trail from beginning to end.*

MASS GIS **Data Viewer**   <u>*Student Training*</u>

Focus: **Conservation/Recreation…Trails**
Local Perspective   *Lesson #6*
Data Sheet

**Social Studies
Mathematics
Language Arts
Science**

"Urban Trails – Designing a Historical and Open Space Walking Trail in your Community"

Name: _____ Date: _____

1. Which "Polygon" data layers (Historical) apply to your community?
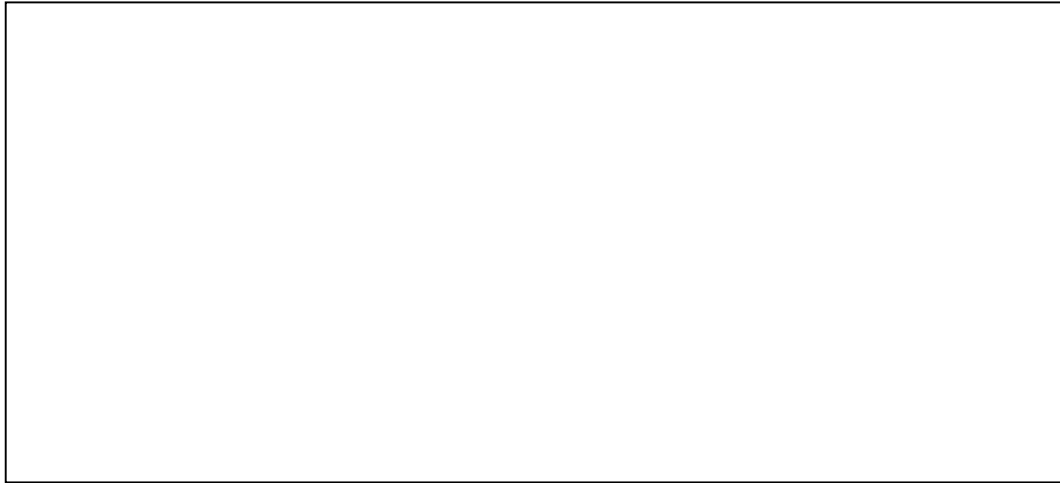
2. Record the scale of your View, prior to "Zooming in".
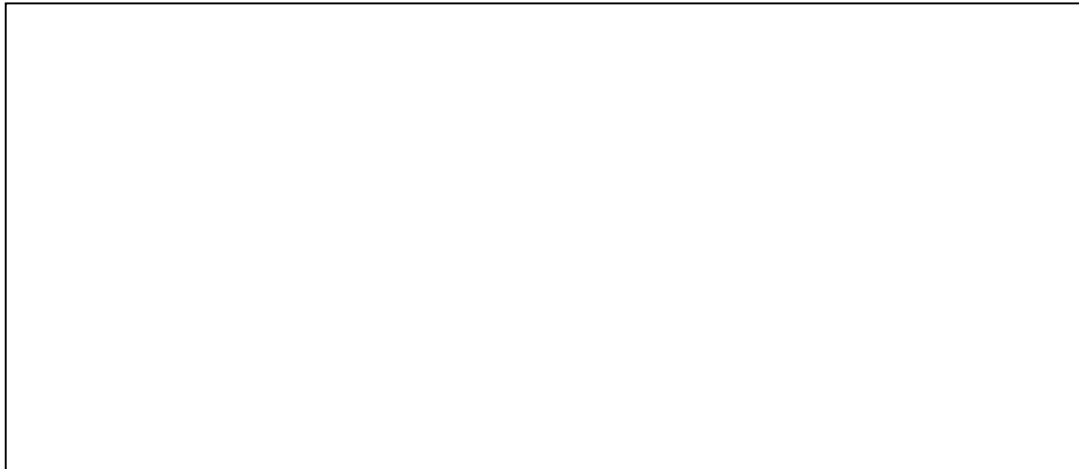
3. Record the scale of your "Zoomed In" View.

4. How much of a mile does the scale of 1:10,000 represent? Do your work in the space provided.

Work:

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5. Provide a list of Open Space sites near your school that interest you for a trail:

6. Provide a list of Historical Sites (points) near your school that interest you for a trail:

7. Provide a list of Historical (polygon) sites near your school that interest you for a trail:
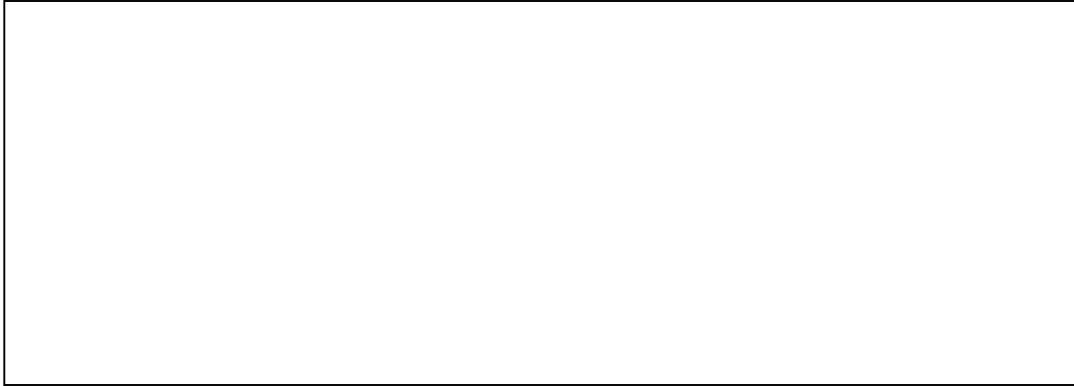
8. List any other sites of interest that you observed near your school when you used the Ortho Photo as a "base map" in your View. Only list the sites that you might want to include in a "walk by" trail.

9. Why are we making the "Distance Units" miles and not changing the "Map Units" instead?

10. Record the total mileage of your drafted trail in the box provided.

11. Provide an explanation of what is meant by the term "Base Map" when used by environmental and regional planners.

12. List the roads or streets using the "TIGER rds" theme that you used in your trail design.

13. Write a brief description that provides directions so an individual could follow your trail from beginning to end.

MassGIS Data Viewer   *Student Training*
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Local Perspective   *Lesson #6*
Trail Committee Question Sheet

Social Studies
Mathematics
Language Arts
Science

"Urban Trails –
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Name: _____ Date: _____

1. List the names of the historical sites/areas in your community.

2. In what part of your community would you like to have the trail and why?

3. What is the total length of your trail when it is completed?

4. Does your trail end by returning to the point of beginning?

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5. Are there any parking areas, public transportation or other types of structures that encourage student and citizen access to your proposed trail? If so explain.

6. Can your proposed trail be accessed by the handicap? If not why?

MASS GIS **Data Viewer** _Student Training_

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Local Perspective   _Lesson #6_
Trail Committee Recommendation

Social Studies
Mathematics
Language Arts
Science

"Urban Trails –
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Walking Trail in your Community"

Name: _____ Date: _____

In the space below, provide a position statement explains why the Trails Committee
should approve your trail, and include how you have addressed the criteria
established by the Urban Trails Committee.